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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/805,153 | 03/14/2001 | Kenichiro Suetsugu | 2001_0307A | 1770 |

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| EXAMINER |
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EDMONDSON, LYNNE RENEE

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| ART UNIT | PAPER NUMBER |
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1725

DATE MAILED: 04/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/805,153

Applicant(s)

SUETSUGU ET AL.

Examiner

Lynne Edmondson

Art Unit

1725

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21,22,24-28 and 31-100 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 36-95 is/are allowed.
- 6) ☒ Claim(s) 21-27,31,33 and 96-100 is/are rejected.
- 7) ☒ Claim(s) 28,32,34 and 35 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 21-27, 31 and 33 are rejected under 35 U.S.C. 102(b) as being anticipated by Kapoor et al. (USPN 5567525).

Kapoor teaches a connecting material comprising solder into which a particulate hydrogen storage material (V) is dispersed (col 2 lines 45-48 and col 3 lines 49-67).

The material changes volume as do most metals when heated. The solder (braze) is heated and cooled to form the connection (col 4 line 62 – col 5 line 18). Although there is no statement of storing hydrogen, as the solder contains material capable of storing hydrogen and is dispersed in the solder, it is presumed that the same material in the same form will be capable of performing the same function.

3. Claims 96-100 are rejected under 35 U.S.C. 102(e) as being anticipated by Farooq et al. (USPN 6574859 B2).

Farooq teaches a method of mounting multiple electronic components such as chips on a circuit board (col 1 lines 10-16) using a connecting material comprising solder into which a particulate hydrogen storage material (Pd) is dispersed (col 3 lines 10-35 and col 7 lines 7-20). The material changes volume as do most metals when heated. The connecting material is in cream (paste) form (col 7 lines 52-57). The solder is heated and cooled to form the connection (joint, col 7 line 52 – col 8 line 6). Although there is no statement of storing hydrogen, as the material contains material capable of storing hydrogen and is dispersed in the solder, it is presumed that the same material in the same form will be capable of performing the same function. It is noted that there is no claim limitation regarding solders that absorb hydrogen at different rates. See also Farooq claims 1, 4, 8, 11, 14 and 17-25.

Response to Arguments

4. Applicant's arguments with respect to claims 21-100 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

5. Claims 28, 32, 34 and 35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 1725

6. Claims 36-95 are allowed.
7. The following is an examiner's statement of reasons for allowance: The closest prior art teaches the invention essentially as claimed using different solders having different properties for joining different components. However, only one solder contains a hydrogen storage metal. The other is conventional Pb/Sn eutectic solder. See Farooq (USPN 6574859 B2). The closest prior art teaching the detachment method teaches the method essentially as claimed with the same results but does not clearly disclose dispersed particles in the connecting material at the beginning of the process. See Suga (JPN 10-261866 A).

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Leerssen et al. (foil, paste), Mayer et al. (USPN 4580714), Ekkelboom (USPN 4038579), Berry (USPN 3136633), Eiter et al. (USPN 5830292), Okutomi et al. (JPN 06-239668 A, connecting material) and Nippon (JPN 63-17267 A, connecting material).

Art Unit: 1725

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (571) 272-1172. The examiner can normally be reached on Monday through Thursday from 6:30 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (571) 272-1171. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lynne Edmondson
Primary Examiner
Art Unit 1725

LRE

LYNNE R. EDMONDSON
PRIMARY EXAMINER

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3/31/05